



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

October 1, 2012

MEMORANDUM TO: Tom Koch, P.E.
Assistant State Structures Engineer - Design

ATTENTION: Mack Bailey, P.E.
Project Engineer

FROM: *for* Njoroge Wainaina, P.E.
State Geotechnical Engineer *Eric Williams*

STATE PROJECT: 7B.206814.11
FEDERAL PROJECT: N/A
COUNTY: Orange

DESCRIPTION: Bridge No. 232 on SR 1945 over Phil's Creek

SUBJECT: Bridge Foundation Recommendations

The Geotechnical Engineering Unit has completed the subsurface investigation (previously investigated under WBS 7B.206811 in August 2011) and has prepared the foundation design recommendations for the above structure and presents the following project data:

 X Bridge Inventory (11) pages (previously investigated in August 2011 under WBS 7B.206811)

 X Foundation Design Recommendations (2) page

 X Design Calculations (1) page

 Special Provisions () pages

Please call David Teague, P.E. or Eric Williams, P.E. at (919) 707-6850 if there are any questions concerning this memorandum.

NWW/DLT

Attachment

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

TELEPHONE: 919-707-6850
FAX: 919-250-4237

WEBSITE: WWW.DOH.DOT.STATE.NC.US

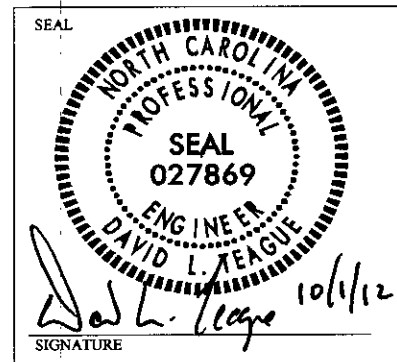
LOCATION:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

FOUNDATION RECOMMENDATIONS

PROJECT 7B.206814.11
T.I.P. NO. N/A
COUNTY Orange
STATION 15+08.00 -L-

DESCRIPTION Bridge No. 232 on SR 1945
over Phil's Creek

| | INITIALS | DATE |
|----------|----------|---------|
| DESIGN | DLT | Sep-12 |
| CHECK | GCB | 10/1/12 |
| APPROVAL | ENW | 10/1/12 |



| | STATION | FOUNDATION TYPE | FACTORED RESISTANCE | MISCELLANEOUS DETAILS |
|------------|--------------|--------------------------------|------------------------|--|
| END BENT 1 | 14+63.00 -L- | Cap on HP 14x73 Steel Piles | 130 Tons/Pile | Avg. Bottom of Cap El. = 420 ft Estimated Pile Length = 10 ft. Number of Piles = 5 |
| END BENT 2 | 15+53.00 -L- | Cap on HP 14x73 Steel Piles | 130 Tons/Pile | Avg. Bottom of Cap El. = 419 ft Estimated Pile Length = 10 ft. Number of Piles = 5 |

FOUNDATION RECOMMENDATION NOTES ON PLANS

- 1) FOR PILES SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- 2) PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 130 TONS PER PILE.
- 3) DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 215 TONS PER PILE.
- 4) STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO. 1 AND END BENT NO. 2. FOR STEEL PILE POINTS SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

FOUNDATION RECOMMENDATION COMMENTS

- 1) END BENT SLOPES OF 1.5:1 ARE OK WITH SLOPE PROTECTION.
- 2) SUB REGIONAL TIER APPROACH FILLS ARE REQUIRED AT BOTH END BENTS.

| | | | |
|--|------------------------------------|----------|-----------------------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS HIGHWAY BUILDING PO BOX 25201 RALEIGH, NORTH CAROLINA 27611 | SUBJECT: Bridge No. 232 on SR 1945 | | PROJECT: 7B.206814.11 |
| | | | COUNTY: Orange |
| | PREPARED BY: | DLT | STATION: 15+08.00 -L- |
| | DATE: | 09/28/12 | |
| | CHECKED BY: | GCB | SHEET: |
| | DATE: | 10/1/12 | |

SUMMARY

FOUNDATION TYPE: Cap on HP 14x73 Steel Piles

| | <u>EB1</u> | <u>EB2</u> |
|--------------------------------------|------------|------------|
| BOC ELEV. (ft) = | 420 | 419 |
| POF ELEV. (ft) = | N/A | N/A |
| TIP ELEV. (ft) = | N/A | N/A |
| DESIGN SCOUR (ft) = | N/A | N/A |
| SCOUR CRITICAL (ft) = | N/A | N/A |
| FACTORED RESISTANCE (TONS) = | 130 | 130 |
| REQUIRED DRIVING RESISTANCE (TONS) = | 215 | 215 |
| NUMBER OF PILES PER BENT = | 5 | 5 |
| ESTIMATED PILE LENGTH (FT) = | 10 | 10 |

PILE PAY ITEMS

(Revised 8/15/12)

WBS ELEMENT 7B.206814.11

DATE 9/28/2012

TIP NO. N/A

DESIGNED BY DLT

COUNTY Orange

CHECKED BY GCD

STATION 15+08.00 -L-

DESCRIPTION Bridge No. 232 on SR 1945
over Phil's Creek

NUMBER OF BENTS WITH PILES _____
NUMBER OF PILES PER BENT _____
NUMBER OF END BENTS WITH PILES _____
NUMBER OF PILES PER END BENT _____

Only required for "Predrilling
for Piles" & "Pile
Excavation" pay items

| Bent # or End Bent # | PILE PAY ITEM QUANTITIES | | | | | | PDA Testing (per each) |
|-------------------------|-------------------------------------|---------------------------------------|---|--------------------------------|---------------------------------------|----------------|------------------------------|
| | Steel Pile Points (yes/no) | Pipe Pile Plates (yes/no/maybe) | Predrilling For Piles (per linear ft) | Pile Redrives (per each) | Pile Excavation (per linear ft) | | |
| | | | | | In Soil | Not In Soil | |
| End Bent #1 | yes | | | | | | |
| End Bent #2 | yes | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| TOTALS | | | 0 | 0 | 0 | 0 | |

Notes:

Blanks or "no" represent quantity of zero.

If steel pile points are required, calculate quantity of "Steel Pile Points" as equal to the number of steel piles.

If pipe pile plates are or may be required, calculate the quantity of "Pipe Pile Plates" as equal to the number of pipe piles.

Show quantity of "PDA Testing" on the plans as total only.

If quantity of "PDA Testing" is 3 or less, reference "Pile Driving Criteria" provision in PDA notes on plans and include "Pile Driving Criteria" provision in the contract.